**ARCHITECTURE 358/658**
Oliver Thursday 1:00-3:30 Spring 2014 AH 210

# CAST MODERNITY: concrete & the development of modern architecture

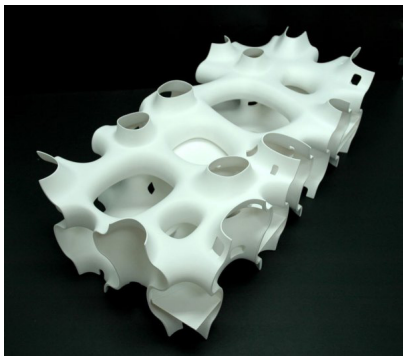
*"Broken down in sequence, reinforced concrete construction proceeds as follows. First, the conjectural structure of shuttering is erected-the negative of the initial thesis. Then steel reinforcements- Dimensioned strictly according to the rational principles of Newtonian physics-are inserted: the reinforcing process of paranoiac calculation. Then a mouse-gray liquid is poured into the empty speculative counter-forms to give them permanent life on earth, an undeniable reality, especially after the signs of the initial madness-the shuttering-have been removed, leaving only the fingerprints of the wood's grain. Infinitely malleable at first, then suddenly hard as rock, reinforced concrete can objectify vacuity and fullness with equal ease: it is the architect's plastic. It is no coincidence that each reinforced concrete building site, with its mad clutter of shuttering, resembles Noah's project: an inexplicably land-locked shipyard. What Noah needed was reinforced concrete. What Modern Architecture needs is a flood."*

Rem Koolhaas, "Delirious New York"

## Objectives

This course will study the innate relationship between idea and technique through the medium of concrete construction. Concrete is one of the oldest and most ubiquitous of constructional systems with an unsurpassed range of applications and material effects. The development and advancement in the late nineteenth century of steel, glass, and concrete construction technologies, was fundamental to the development and unfolding of Modern architecture. This class will look closely at how concrete was complicit and instrumental in realizing the multiplicity of polemics and ideas that constituted high modernity. Lectures will be a series of topical case study histories that span the breath of the past century and address the relevance of these issues to contemporary practice.

It is concrete's ability to be deployed in such a broad range of forms that distinguishes it from rival systems of construction. Concrete can be monolithic, thick and archaic as well thin, delicate, and precise. The advancements in concrete technology over the last five years suggests a new realm of possibilities that parallel the torrent of innovation associated with the invention of Ferro-concrete over a hundred years ago. Highly plasticized, self consolidating, matrix reinforced concrete offers extraordinary new possibilities for the same material system that made possible the previously unseen monumentality of antique Rome.



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## Schedule

1/16 **Introduction:** overview of the course goals, process, lecture topics, and design problem

1/23 **Technique:** contemporary concrete construction methodologies

This lecture is intended as a primer of all of the major typologies of concrete construction: in-situ, gunite/shotcreet, precast, pretension/post-tensioned, tiltwall, cmu, self compacting concrete (SCC), ultra-high performance (UHPC), reactive powder concrete (RPC), autoclaved aerated concrete (ACC), Engineered Cementitious Composites (ECC), and the future.

1/30 **Sanctuary:** sacred architecture and modernity

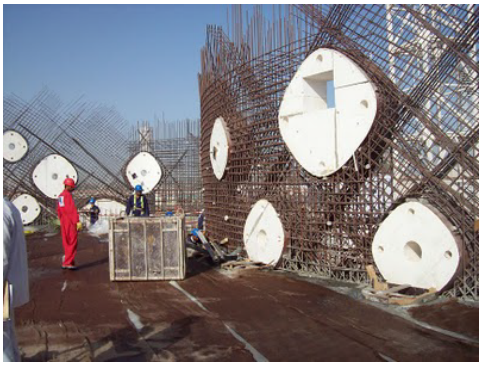
Subject: The typological transformation of sacred architecture from Rome to the end of the 20th century
Architects: Wright, Le Corbusier, Khan, Ando, Eisenman
Buildings: Unity Temple, Ronchamp, Unity Rochester, Church of the Light, Church of the year 2000
Histories: Goldhagen,

2/06 **Extension:** the maison domino from corb to koolhaas

Subject: The diagrammatic persistence of the Domino
Architects: Le Corbusier, Koolhaas (OMA)
Buildings: The Domino, Villa Stein, Villa Savoye , Villa Dall'Ava, Maison a' Bordeaux, Paris National Library, Agadir, Jussieu Library, Educatorium
Histories: Gideon, Rowe, Colomina

2/13 **Lighter Than air:** the jet set and the invention of the modern airport

Subject: America's post-war optimism and the return of technology
Architects: Saarinen & his legacy
Buildings: TWA Terminal, Dulles International Airport
Histories: Scully, Kwintner



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2/20 **Thin:** concrete origami

Subject: Concrete as a medium of precision
Architects: Candella & Wright
Buildings: Various Candella & Johnson Wax, Dulles International Airport
Histories: Frampton

2/27 **Design Project Review #1**

3/06 **Spring Break**

3/13 **Brutal:** The cathartic appeal of the Archaic

Subject: The post-war collapse of the mythologies of technology
Architects: Le Courbusier, Rudolph, Kallmann & McKinnell
Buildings: Latourette, Yale Art & Architecture, Boston City Hall
Histories: Smithsons, Bahnam, Scully, Venturi & Scott Brown

3/20 ***Firmness*, Commodity, and Delight:** the idea of permanence and the modern necropolis

Subject: Temporality and modern architecture
Architects: Scarpa, Rossi, Miralles
Buildings: Brion family tomb, Cemetery of San Cataldo, Igualada Cemetery
Histories: Frampton, Rossi, Mostafavi & Leatherbarrow

3/27 **Mid-Term Recess**

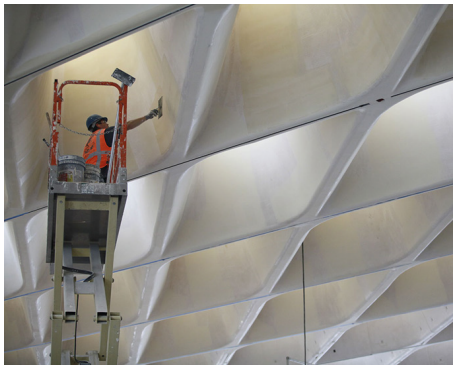
4/03 **Absence:** kahn, the kimbell, and post-modernity

Subject: The ruin as a post-structuralist device
Architects: Kahn
Buildings: The Kimbell
Histories: Scully, Benedikt

4/10 **Conclusions**

4/17 **Design Project Review #2**

5/08 **Final Review**



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## Reading

### REQUIRED

Sanford Kwinter, "Concrete: Dead or Alive?" *Solid States: Concrete In Transition*, (New York, Princeton Architectural Press, 2010) 39-46

Antione Picon, "Architecture and Technology: Two Centuries of Creative Tension", *Liquid Stone: New Architecture in Concrete*, (New York, Princeton Architectural Press) 8-19

Detlef Mertins, "Pervasive Plasticity", *Solid States: Concrete In Transition*, (New York, Princeton Architectural Press, 2010) 27-38

Sheila Kennedy, "Material Presence", *Material Misuse* ( London, Architectural Association, 2001) 5-20

### SUGGESTED

EXTENSION:
Peter Eisenman, "Aspects of Modernism: Maison Dom-ino and the Self-Referential Sign", Oppositions 15/16, (Cambridge, MIT Press, 119-128)

SANCTUARY:
Sarah Williams Goldhagen, "Rethinking Modernism: Authenticity and Community in the First Unitarian Church Rochester", *Louis Kahn's Situated Modernism*, (New Haven & London, Yale University Press, 2001) 136-161

AERODYNAMIC:
Sanford Kwinter, "Physical Theory and Modernity: Einstein, Boccioni, Sant' Elia", *Architectures of Time: Toward a Theory of the Event in Modernist Culture*, (MIT Press, Cambridge, 2001) v v, pages 54-100

Vincent Scully, *American Architecture and Urbanism*, (New York, Praeger Publishers, 1969), 176-224

THIN: Kenneth Frampton, "Introduction: The Johnson Wax Buildings and the Angel of History", *Frank Lloyd Wright and The Johnson Wax Building*, (New York, Rizzoli, 1986) pages XI-XIV

Tullia Lori (Giovanni Leoni) , Pier Luigi Nervi: Engineer, Architect, Builder, A Life Dedicated to Reinforced Concrete, *Pier Luigi Nervi*, (Motta Architecttura, 2009), 20-27

ARCHAIC:
David Monteyne, "Bunker Architecture For the Cold War: Boston City Hall", *Fallout Shelter: Designing For Civil Defense In The Cold War*, (University of Minnesota, Minneapolis, 2011), 231-270

Peter Eisenman, "Texts of Analogy: Aldo Rossi, Cemetery of San Cataldo 1971-78", *Ten Canonical Buildings 1950-2000*, (Rizzoli, New York, 2008) pages

Moshen Mostafavi and David Leatherbarrow , *"On Weathering: The Life of Buildings In Time",* (Cambridge & London, The MIT Press, 2001

ABSENCE
Christian Bonnefoi, "Louis Kahn and Minimalism", "Oppositions 24", Spring1981, MIT Press, pages 1-25

Michael Benedikt, *Deconstructing the Kimbell : An Essay On Meaning and Architecture*, (New York, Sites/Lumen Books, 1991), 52-91

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## Requirements

The principal course work will be a semester long research and design problem that will be executed in teams of two. The project will be reviewed twice during the semester and at a final jury during the final exam period.

## Evaluation

Course work/grades will be determined in the following manner:

Design Project: 80%

Attendance / Participation: 20%

Design Problem Evaluation:

conceptual ambition and clarity: 25%
methods & means development: 60%
final presentation quality: 15%

Punctual class attendance is mandatory and role will be taken weekly. Every two missed class periods will result in a full letter grade drop.

## Design Problem

### IDEA + TECHNIQUE

The design problem for the semester will explore the complicated relationship between a conceptual desire and the methodic articulation of that idea from sketch to construction site. You will be required to create a holistic system of concrete construction that addresses a very specific architectural problem. The problem is inspired by Sheila Kennedy's concept of "Material Misuse" which suggests a deep understanding of a material or material system affords architects substantive design opportunities thru the purposeful subversion of those rules. Given that provocation, this semester we will look to the heaviest and slowest of construction types for options to deliver rapidly deployable emergency housing.

The Indonesian Tsunami in 2004, the earthquake in Haiti in 2010, and the recent typhoon in the Philippines are very recent examples of natural disasters that have created dire conditions of shelter in the immediate wake of each catastrophe. We are going to develop a single house prototype that can be quickly deployed or site fabricated in rural locations on a massive scale. The housing should address the immediate problems of homelessness and lack of services left in the wake of natural disasters but should also be able to transform itself into the seed stock of long term domestic structures. Cost and ease of implementation are necessarily of paramount concern, but in no way should be thought of as 'basic' or 'minimal' shelter. You are being asked to use the very specific and stringent limitations of this problem to invent a fully rounded architectural solution that not only replaces the lost indigenous housing stock, but creates a better housing paradigm than what existed prior to the disaster. Our test bed will be the coastal areas of the Philippines that were recently struck by Typhoon Haiyan.